CLAIMS

What is claimed is:

1.   A method of coding the bit-planes of an array of numbers comprising the steps

2   of:

converting the values in the array of numbers to binary;

4   determining the number of bit-planes based on a number having the maximum

absolute value of the array of numbers;

6   generating a tree structured description of significance information for each bit-plane

of the array based on a modified quad-tree coding technique;

8   generating an SNR scalable encoding of the significance information for each bit-

plane by describing new branches and leaves of the tree corresponding to each bit-plane in a

10   bottom-up-depth-first manner;

generating an encoding of refinement information for each bit-plane; and

12   generating a SNR scalable description of the array by concatenating the encoding of

the significance information and the refinement information generated for each bit-plane.

2.   The method according to claim 1 further comprising the step of truncating the

2   binary values to a predetermined level of accuracy after the step of converting.

3.   A method of coding the bit-planes of an array of numbers, wherein the values

2   in the array of numbers have been converted to binary, the binary values have been truncated

to a predetermined level of accuracy, and the number of bit-planes has been determined based

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4   on a number having the maximum absolute value of the array of numbers, the method

comprising the steps of:

6   generating a tree structured description of significance information for each bit-plane

of the array based on a modified quad-tree coding technique;

8   generating an SNR scalable encoding of the significance information for each bit-

plane by describing new branches and leaves of the tree corresponding to each bit-plane in a

10   bottom-up-depth-first manner;

         generating an encoding of refinement information for each bit-plane; and

12   generating a SNR scalable description of the array by concatenating the encoding of

the significance information and the refinement information generated for each bit-plane.

         4.   An apparatus for coding the bit-planes of an array of numbers comprising:

2   means for converting the values in the array of numbers to binary;

         means for truncating the binary values to a predetermined level of accuracy;

4   means for determining the number of bit-planes based on a number having the

maximum absolute value of the array of numbers;

6   means for generating a tree structured description of significance information for each

bit-plane of the array based on a modified quad-tree coding technique;

8   means for generating an SNR scalable encoding of the significance information for

each bit-plane by describing new branches and leaves of the tree corresponding to each bit-

10   plane in a bottom-up-depth-first manner;

         means for generating an encoding of refinement information for each bit-plane; and

12   means for generating a SNR scalable description of the array by concatenating the

encoding of the significance information and the refinement information generated for each

14   bit-plane.

5.   The apparatus according to claim 4 further comprising means for truncating

2   the binary values to a predetermined level of accuracy.

6.   A apparatus for coding the bit-planes of an array of numbers, wherein the

2   values in the array of numbers have been converted to binary, the binary values have been

truncated to a predetermined level of accuracy, and the number of bit-planes has been

4   determined based on a number having the maximum absolute value of the array of numbers,

the apparatus comprising:

6   means for generating a tree structured description of significance information for each

bit-plane of the array based on a modified quad-tree coding technique;

8   means for generating an SNR scalable encoding of the significance information for

each bit-plane by describing new branches and leaves of the tree corresponding to each bit-

10   plane in a bottom-up-depth-first manner;

means for generating an encoding of refinement information for each bit-plane; and

12   means for generating a SNR scalable description of the array by concatenating the

encoding of the significance information and the refinement information generated for each

14   bit-plane.

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7.   A computer coding system for an input image, the system having a sampling

2   filter which decomposes the input image into four frequency subbands and outputs a Wavelet

transform, the system comprising:

4   an encoder which generates a SNR scalable description of the Wavelet transform by

concatenating an encoding of significance information and an encoding of refinement

6   information generated for each bit-plane, wherein the encoding of the significance

information for each bit-plane is generated by describing new branches and leaves of the tree

8   corresponding to each bit-plane in a bottom-up-depth-first manner.

8.   The system according to claim 7 further comprising a decoder which utilizes

2   the SNR scalable description of the Wavelet transform to produce an output image.